

## Description

# METHOD AND APPARATUS FOR RECORDING HITS WHILE SPARRING

### CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority to U. S. Provisional Patent Application Serial No. 60/319,983 filed February 28, 2003.

### BACKGROUND OF INVENTION

[0002] The martial arts such as karate, kung-fu, kick boxing, boxing and tae-kwon-do are very popular sports that enjoy contested sparring competitions in an exhibition that are scored by one or more judges. Points are awarded for striking first and/or based upon the number of blows delivered to designated legal targets on a contestant's body. One significant drawback to the judging of these events includes the fact that judges are only human and can physically view the competition only from limited vantage points. Also, the hits inflicted on a contestant can occur in rapid succession. This flurry or succession of hits can oc-

cur so rapidly that judges have an extremely difficult time doing their job. Also, judges must physically stay out of the way of the moving combatants but still count and determine all of the delivered hits.

[0003] The present invention is directed to overcoming one or more of the problems set forth above.

#### **SUMMARY OF INVENTION**

[0004] These are merely a few illustrative aspects of the present invention and should not be deemed an all-inclusive listing of the innumerable aspects associated with the present invention. These and other aspects will become apparent to those skilled in the martial arts in light of the following disclosure and accompanying drawings.

[0005] In one aspect of this present invention, an apparatus to record hits to a contestant engaged in sparring with another contestant is disclosed. The apparatus includes a first item of clothing having at least one first electrically conductive strip and at least one second electrically conductive strip, wherein at least one first electrically conductive strip is adjacent to at least one second electrically conductive strip, a voltage receiving mechanism, having a first lead and a second lead, wherein the first lead is electrically connected to the at least one first electrically con-

ductive strip and the second lead is electrically connected to the at least one second electrically conductive strip, a second item of clothing, having at least one electrically conductive portion, which can electrically connect at least one first electrically conductive strip and at least one second electrically conductive strip of the first item of clothing when the at least one electrically conductive portion of the second item of clothing is in contact with the first item of clothing and an indicating device that is electrically connected to at least one first electrically conductive strip and at least one second electrically conductive strip and provides an indication when the at least one electrically conductive portion of the second item of clothing electrically connects at least one first electrically conductive strip and at least one second electrically conductive strip of the first item of clothing, which occurs when the second item of clothing is in contact with the first item of clothing.

[0006] In another aspect of this present invention, an apparatus to record hits to a contestant engaged in sparring with another contestant is disclosed. The apparatus includes a first item of clothing having at least one first electrically conductive strip and at least one second electrically con-

ductive strip, wherein at least one first electrically conductive strip is adjacent to at least one second electrically conductive strip, a voltage receiving mechanism, having a first lead and a second lead, wherein the first lead is electrically connected to the at least one first electrically conductive strip and the second lead is electrically connected to the at least one second electrically conductive strip, a second item of clothing, having at least one electrically conductive portion, which can electrically connect at least one the first electrically conductive strip and at least one the second electrically conductive strip of the first item of clothing, which occurs when the at least one electrically conductive portion of the second item of clothing is in contact with the first item of clothing, a first indicating device that is electrically connected to at least one first electrically conductive strip and at least one second electrically conductive strip and provides an indication when the electrically conductive portion of the second item of clothing electrically connects at least one first electrically conductive strip and at least one second electrically conductive strip of the first item of clothing, which occurs when the second item of clothing is in contact with the first item of clothing and a first transmitter that is electri-

cally connected to at least one first electrically conductive strip and at least one second electrically conductive strip and transmits an indication when the electrically conductive portion of the second item of clothing electrically connects at least one first electrically conductive strip and at least one second electrically conductive strip of the first item of clothing, which occurs when the second item of clothing is in contact with the first item of clothing.

[0007] In yet another aspect of this present invention, a method to record hits to a contestant engaged in sparring with another contestant is disclosed. The method includes contacting a first item of clothing with a second item of clothing, wherein the first item of clothing includes at least one first electrically conductive strip and at least one second electrically conductive strip, wherein at least one the first electrically conductive strip is adjacent to at least one second electrically conductive strip and there is a voltage receiving mechanism, having a first lead and a second lead, wherein the first lead is electrically connected to the at least one first electrically conductive strip and the second lead is electrically connected to the at least one second electrically conductive strip and the second item of clothing includes at least one electrically con-

ductive portion that can electrically connect at least one first electrically conductive strip and at least one second electrically conductive strip of the first item of clothing when at least one electrically conductive portion of the second item of clothing is in contact with the first item of clothing and providing an indication with an indicating device that is electrically connected to at least one first electrically conductive strip and at least one second electrically conductive strip when at least one electrically conductive portion of the second item of clothing electrically connects at least one first electrically conductive strip and at least one second electrically conductive strip of the first item of clothing, which occurs when the second item of clothing is in contact with the first item of clothing.

[0008] In still another aspect of this present invention, a method to record hits to a contestant engaged in sparring with another contestant is disclosed. The method includes contacting a first item of clothing with a second item of clothing, wherein the first item of clothing includes at least one first electrically conductive strip and at least one second electrically conductive strip, wherein at least one the first electrically conductive strip is adjacent to at least one second electrically conductive strip and there is a

voltage receiving mechanism, having a first lead and a second lead, wherein the first lead is electrically connected to the at least one first electrically conductive strip and the second lead is electrically connected to the at least one second electrically conductive strip and the second item of clothing includes at least one electrically conductive portion that can electrically connect at least one first electrically conductive strip and at least one second electrically conductive strip of the first item of clothing when the at least one electrically conductive portion of the second item of clothing is in contact with the first item of clothing, providing an indication with an indicating device that is electrically connected to the at least one first electrically conductive strip and the at least one second electrically conductive strip when the at least one electrically conductive portion of the second item of clothing electrically connects at least one first electrically conductive strip and at least one second electrically conductive strip of the first item of clothing, which occurs when the second item of clothing is in contact with the first item of clothing and transmitting an electronic indication with a first transmitter that is electrically connected to at least one first electrically conductive strip and at least one sec-

ond electrically conductive strip when the electrically conductive portion of the second item of clothing electrically connects at least one first electrically conductive strip and at least one second electrically conductive strip of the first item of clothing, which occurs when the second item of clothing is in contact with the first item of clothing.

[0009] These are merely some of the innumerable illustrative aspects of this present invention and should not be deemed an all-inclusive listing. These and other aspects will become apparent to those skilled in the martial arts in light of the following disclosure and accompanying drawings.

#### **BRIEF DESCRIPTION OF DRAWINGS**

[0010] For a better understanding of the present invention, reference may be made to the accompanying drawings.

[0011] FIG. 1 is a front elevational view of the apparatus for recording hits while sparring associated with the present invention with an illustrative contestant.

[0012] FIG. 2 is a side elevational view of the apparatus for recording hits while sparring associated with the present invention, as shown in FIG. 1, with an illustrative contestant.

[0013] FIG. 3 is a schematic diagram of illustrative targets including a torso target, a head target and a face target that is



electrically connected to the electrical indicator circuit for providing an indication when any one of the above targets are in contact with an opposing contestant's weapon.

[0014] FIG. 4 is a schematic diagram of illustrative targets including a torso target, a head target and a face target, as shown in FIG. 3, that is electrically connected to an alternative embodiment of an the electrical indicator circuit for providing an indication when any one of the above targets are in contact with an opposing contestant's weapon that includes a transmitter for sending signals to a remote location when any one of the above targets are in contact with an opposing contestant's weapon and a receiver for receiving signals indicating when the opposing contestant has had one of his or her targets in contact with the contestant's weapon.

[0015] FIG. 5 is an isolated schematic diagram of the conductors utilized in a back portion of a headgear that functions as a target.

[0016] FIG. 6 is an isolated schematic diagram of the conductors utilized in a right side portion of headgear that functions as a target.

[0017] FIG. 7 is an isolated schematic diagram of the conductors utilized in a left side portion of headgear that functions as

a target.

[0018] FIG. 8 is an isolated schematic diagram of the conductors utilized on a top portion of headgear that functions as a target.

[0019] FIG. 9 is a schematic diagram of the vest illustrated in FIGS. 3 and 4, wherein the vest is separated into electrically independent regions that each region function as a separate target with illustrative examples that include a torso, an abdomen, a groin, a right lateral trunk and a left lateral trunk.

[0020] FIG. 10 is a isolated top view of an electrically independent back portion of a glove used as a weapon by a contestant, where the back portion of the glove is electrically independent from other portions of the glove so that a determination can be made when this back portion of the fist of a contestant strikes a target.

[0021] FIG. 11 is a isolated front view of a front portion of a glove used as a weapon by a contestant, where the front portion of the glove is electrically independent from other portions of the glove so that a determination can be made when this front portion of the fist of a contestant strikes a target.

[0022] FIG. 12 is a isolated top view of a portion of a glove used

as a weapon by a contestant, where the side portion of the glove is electrically independent from other portions of the glove so that a determination can be made when the radial side of the hand (otherwise known as the thumb side of the hand) of a contestant strikes a target.

[0023] FIG. 13 is a isolated bottom view of a portion of a glove used as a weapon by a contestant, where the side portion of the glove is electrically independent from other portions of the glove so that a determination can be made when the ulnar side of the hand (otherwise known as the little finger side of the hand) of a contestant strikes a target.

[0024] FIG. 14 is a isolated top view of a portion of a boot used as a weapon by a contestant, where the top portion of the boot is electrically independent from other portions of the boot so that a determination can be made when the instep of the foot (otherwise known as the top of the foot) of a contestant strikes a target.

[0025] FIG. 15 is a isolated top view of a portion of a boot used as a weapon by a contestant, where the back of the heel for the boot is electrically independent from other portions of the boot so that a determination can be made when the back of the heel of the foot (otherwise known as

the posterior heel) of a contestant strikes a target.

[0026] FIG. 16 is a isolated bottom view of a portion of a boot used as a weapon by a contestant, where the ball of the foot for the boot is electrically independent from other portions of the boot so that a determination can be made when the ball of the foot of a contestant strikes a target.

[0027] FIG. 17 is a isolated bottom view of a portion of a boot used as a weapon by a contestant, where the bottom of the heel for contestant wearing the boot is electrically independent from other portions of the boot so that a determination can be made when the bottom of the heel for the foot (otherwise known as the plantar heel) of a contestant strikes a target.

[0028] FIG. 18 is a top view of an illustrative electronic display with processor and input devices, preferably utilized by a referee, judge, or other official, and associated with the present invention.

[0029] FIG. 19 is an isolated view of visual aspects of a complete electronic display shown in FIG. 18, wherein the second contestant strikes the first contestant with a left back fist in the face which is then followed by a right reverse punch (otherwise known as a punch with the front of the right fist) by the second contestant to the torso of the first con-

testant as illustrated by target icons of the first contestant, icon weapons of the second contestant and digital outputs for the elapsed times involved.

[0030] FIG. 20 is an isolated view of visual aspects of a complete electronic display shown in FIG. 18, wherein the second contestant strikes the first contestant with the top of the left foot in the right side of the head and simultaneously the first contestant strikes the second contestant with the top of the left foot to the groin, which is then followed by the first contestant striking the second contestant, one-half a second (0.5 seconds) later with a left reverse punch (otherwise known as the front of the left fist) to the left portion of the head as illustrated by target icons of the first contestant and the second contestant, icon weapons of the first contestant and the second contestant and digital outputs for the elapsed times involved.

[0031] FIG. 21 is an isolated view of visual aspects of a first type of abbreviated electronic display shown in FIG. 18, wherein the second contestant strikes the first contestant with a left back fist in the face that is then followed by a right reverse punch by the second contestant to the torso of the first contestant as illustrated by target icons of the first contestant, icon weapons of the second contestant

and digital outputs for the elapsed times involved.

[0032] FIG. 22 is an isolated view of visual aspects of a second type of abbreviated electronic display shown in FIG. 18, wherein the second contestant strikes the first contestant with a left back fist in the face that is then followed by a kick by the second contestant to the first contestant with a right foot to the torso as illustrated by target icons of the first contestant, alphabetic representations of weapons of the second contestant and digital outputs for the elapsed times involved.

[0033] FIG. 23 is an isolated view of aspects of the second type of abbreviated electronic display shown in FIG. 18, wherein the second contestant strikes the first contestant with a left back fist in the face which is then followed in 0.2 seconds by a strike by the first contestant to the second contestant with a right reverse punch to the torso as illustrated by target icons of the first contestant and second contestant, alphabetic representations of weapons of the first contestant and second contestant and digital outputs for the elapsed times involved.

[0034] FIG. 24 is an isolated view of aspects of the second type of abbreviated electronic display shown in FIG. 18, wherein the second contestant strikes the first contestant with a

left back fist in the face while simultaneously the first contestant strikes the second contestant with a right reverse punch to the torso as illustrated by target icons of the first contestant and second contestant, alphabetic representations of weapons of the first contestant and second contestant and the digital output for the elapsed times involved.

[0035] FIG. 25 is an isolated view of aspects of a second type of abbreviated electronic display shown in FIG. 18, wherein the second contestant strikes the first contestant with a left back fist in the face that simultaneously occurs with a strike by the first contestant to the second contestant with a right reverse punch to the torso, which is then followed by the second contestant striking the back of the head of the first contestant 0.3 seconds later with his or her right hand illustrated by target icons of the first contestant and second contestant, alphabetic representations of weapons of the first contestant and second contestant and the digital output for the elapsed times involved.

[0036] FIG. 26 is an isolated view of aspects of a third type of abbreviated electronic display, as shown in FIG. 18, where the second contestant strikes the first contestant in the face which is followed 0.2 seconds later with the second

contestant striking the first contestant in the torso, which is illustrated by target icons for the first contestant and the digital output for the elapsed times involved.

[0037] FIG. 27 is an electrical schematic of a first transmitter for sending signals, e.g., radio signals, that correspond to targets and/or regions on targets that have been hit and optionally can include signals, e.g., radio signals, that correspond to identification of weapons and/or regions on weapons that complete the circuit on a target or a portion or region on a target.

[0038] FIG. 28 is an electrical schematic of a first receiver for receiving radio signals from the transmitter shown in FIG. 27, which is connected to a processor, that preferably but not necessarily performs signal processing and timing functions, where the processor can receive input from input devices, e.g., pushbuttons or touch screen, and provide an output to first electronic display and optionally can transmit this information to a second transmitter.

[0039] FIG. 29 is an electrical schematic of a second receiver for receiving radio signals from the second transmitter shown in FIG. 28, which is connected to an electronic display, e.g., scoreboard.

[0040] FIG. 30 is an isolated schematic diagram of the electrically



conductive strips utilized in an optimal embodiment that includes intersecting electrically conductive strips forming a lattice-type structure where electrically conductive strips of the same polarity are electrically connected together and intersecting electrically connectors of different polarity are electrically insulated from each other.

#### **DETAILED DESCRIPTION**

[0041] In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the invention. However, it will be understood by those skilled in the martial arts that the present invention may be practiced without these specific details.

[0042] Referring now to the drawings, and initially to FIGS. 1 and 2, which illustrate a sparing suit that is generally indicated by numeral 10. The sparing suit 10 can be used for any type of hand-to-hand contact between contestants including, but not limited to, the martial arts such as karate, kung-fu, kick boxing, boxing, mui tai and tae-kwon-do. As shown in FIG. 1, the sparing suit 10 is shown being worn by a representative contestant 12. The sparing suit 10 includes headgear 14, a vest 16 that extends to the groin area, facemask 36, a left glove 28, a right glove 30, a left boot 32 and a right boot 34. The electrical control

box 38 can be located anywhere on the sparing suit 10 and in an illustrative, but nonlimiting example, can be located near the headgear 14.

[0043] The headgear 14 preferably includes a series of electrically conductive strips that can vary tremendously in number, configuration, size and shape. In the illustrative, but nonlimiting, example shown in FIGS. 3 and 4, there is a first electrically conductive strip 41, a second electrically conductive strip 43, a third electrically conductive strip 45 and a fourth electrically conductive strip 47. The electrically conductive strips 41, 43, 45 and 47 should be adjacent to each other and located in close enough proximity to each other so that when either a left glove 28, a right glove 30, a left boot 32 or a right boot 34 comes in contact with the headgear 14, an electrical circuit is completed between two adjacent electrically conductive strips 41, 43, 45 and 47 to indicate a hit. Preferably, but not necessarily, the electrically conductive strips 41, 43, 45 and 47 are made of metallic foil or similar conductive material that flexes upon impact. The first electrically conductive strip 41 and the third electrically conductive strip 45 are preferably connected via a first electrical conductor 63, e.g., wire, to a first terminal 124. The second electri-

cally conductive strip 43 and the fourth electrically conductive strip 47 are preferably connected via a second electrical conductor 65, e.g., wire, to a second terminal 126.

[0044] The facemask 36 can also include a series of electrically conductive strips that can vary tremendously in number, configuration, size and shape. In the illustrative, but non-limiting example shown in FIGS. 3 and 4, there is a fifth electrically conductive strip 49, a sixth electrically conductive strip 51, a seventh electrically conductive strip 53, an eighth electrically conductive strip 55, a ninth electrically conductive strip 57, a tenth electrically conductive strip 59, an eleventh electrically conductive strip 61 and a twelfth electrically conductive strip 62. The electrically conductive strips 49, 51, 53, 55, 57, 59, 61 and 62 should be adjacent to each other and located in close enough proximity to each other so that when either a left glove 28, a right glove 30, a left boot 32 or a right boot 34 comes in contact with the facemask 36, an electrical circuit is completed between two adjacent electrically conductive strips 49, 51, 53, 55, 57, 59, 61 and 62 to indicate a hit. Preferably, but not necessarily, the electrically conductive strips 49, 51, 53, 55, 57, 59, 61 and 62 are

made of metallic foil or similar conductive material that flexes upon impact. The fifth electrically conductive strip 49, the seventh electrically conductive strip 53, the ninth electrically conductive strip 57 and the eleventh electrically conductive strip 61 are preferably connected via a third electrical conductor 67, e.g., wire, to the first terminal 124. The sixth electrically conductive strip 51, the eighth electrically conductive strip 55, the tenth electrically conductive strip 59 and the twelfth electrically conductive strip 62 are preferably connected via a fourth electrical conductor 69, e.g., wire, to a second terminal 126.

[0045] The vest 16 can also include a series of electrically conductive strips that can vary tremendously in number, configuration, size and shape. In the illustrative, but nonlimiting example shown in FIGS. 3 and 4, there are a series of rows of electrically conductive strips that are in pairs extending in a vertical axis with portions extending horizontally from left-to-right and then from right-to-left sequentially and alternatively along the vertical axis of the vest 16. These can be described as forming pairs of interlocking railroad tracks. One problem with this embodiment is that when a break occurs along the vertical axis of

one of the rows of conducting strips, there will be no electrical conductivity either above or below that point in the vest 16 depending on where the electrical power is connected. The optimal embodiment, as shown in FIG. 30, is a lattice-type structure that is generally indicated by numeral 700. Electrically conductive strips that are connected to a positive polarity are indicated by numerals 702, 704, 706 and 708 while electrically conductive strips connected to a negative polarity are indicated by numerals 710, 712, 714 and 716. There are electrical connections made between electrically conductive strips of the same polarity at the point of intersection. Some illustrative examples where electrically conductive strips of the same polarity intersect are indicated by numeral 720. With this lattice-type structure 700, there are points where the electrically conductive strips of different polarity overlap that are indicated by numeral 722. Preferably, the electrically conductive strips of different polarity are transverse to each other and optimally the electrically conductive strips of different polarity are perpendicular to each other.

[0046] Points 722 must include insulation or insulating material to keep the electrically conductive strips of differing polarities from creating an electrical short. This insulating

material can be made from any of a wide variety of dielectric materials. The advantage to this embodiment is that when there is a break in an electrically conductive strip, the electricity can bypass or conduct around the break through another route and the rest of the spring suit 10 can still function.

[0047] A first pair of alternatively projecting electrically conductive strips is generally indicated by numeral 74 and includes a first vertical row of projecting electrically conductive strips 75 that projects from left to right that alternates with a second vertical row of projecting electrically conductive strips 77 that projects from right to left.

[0048] A second pair of alternatively projecting electrically conductive strips is generally indicated by numeral 78 and includes a third vertical row of projecting electrically conductive strips 79 that projects from left to right that alternates with a fourth vertical row of projecting electrically conductive strips 81 that projects from right to left.

[0049] A third pair of alternatively projecting electrically conductive strips is generally indicated by numeral 82 and includes a fifth vertical row of projecting electrically conductive strips 83 that projects from left to right that alternates with a sixth vertical row of projecting electrically

conductive strips 85 that projects from right to left.

[0050] A fourth pair of alternatively projecting electrically conductive strips is generally indicated by numeral 86 and includes a seventh vertical row of projecting electrically conductive strips 87 that projects from left to right that alternates with an eighth vertical row of projecting electrically conductive strips 89 that projects from right to left.

[0051] A fifth pair of alternatively projecting electrically conductive strips is generally indicated by numeral 90 and includes a ninth vertical row of projecting electrically conductive strips 91 that projects from left to right that alternates with a tenth vertical row of projecting electrically conductive strips 93 that projects from right to left.

[0052] A sixth pair of alternatively projecting electrically conductive strips is generally indicated by numeral 94 and includes an eleventh vertical row of projecting electrically conductive strips 95 that projects from left to right that alternates with a twelfth vertical row of projecting electrically conductive strips 97 that projects from right to left.

[0053] A seventh pair of alternatively projecting electrically conductive strips is generally indicated by numeral 98 and includes a thirteenth vertical row of projecting electrically conductive strips 99 that projects from left to right that

alternates with a fourteenth vertical row of projecting electrically conductive strips 101 that projects from right to left.

[0054] An eighth pair of alternatively projecting electrically conductive strips is generally indicated by numeral 102 and includes a fifteenth vertical row of projecting electrically conductive strips 103 that projects from left to right that alternates with a sixteenth vertical row of projecting electrically conductive strips 105 that projects from right to left.

[0055] A ninth pair of alternatively projecting electrically conductive strips is generally indicated by numeral 106 and includes a seventeenth vertical row of projecting electrically conductive strips 107 that projects from left to right that alternates with an eighteenth vertical row of projecting electrically conductive strips 109 that projects from right to left.

[0056] Finally, a tenth pair of alternatively projecting electrically conductive strips is generally indicated by numeral 110 and includes a nineteenth vertical row of projecting electrically conductive strips 111 that projects from left to right that alternates with a twentieth vertical row of projecting electrically conductive strips 113 that projects



from right to left.

[0057] Within each pair of alternatively projecting electrically conductive strips 74, 78, 82, 86, 90, 94, 98, 102, 106 and 110, the alternating vertical rows of projecting electrically conductive strips: 75 and 77; 79 and 81; 83 and 85; 87 and 89; 91 and 93; 95 and 97; 99 and 101; 103 and 105; 107 and 109; 111 and 113, respectively, need to be adjacent and in close enough proximity to each other so that when a left glove 28, a right glove 30, a left boot 32 or a right boot 34 strikes the vest 16, this completes the electrical circuit between two adjacent projecting electrically conductive strips: 75 and 77; 79 and 81; 83 and 85; 87 and 89; 91 and 93; 95 and 97; 99 and 101; 103 and 105; 107 and 109; and 111 and 113.

[0058] Preferably, but not necessarily, the electrically conductive strips 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111 and 113 are made of metallic foil or similar conductive material that flexes upon impact. The first vertical row of projecting electrically conductive strips 75, the fourth vertical row of projecting electrically conductive strips 81, the fifth vertical row of projecting electrically conductive strips 83, the eighth vertical row of projecting electrically conductive

strips 89, the ninth vertical row of projecting electrically conductive strips 91, the twelfth vertical row of projecting electrically conductive strips 97, the thirteenth vertical row of projecting electrically conductive strips 99, the sixteenth vertical row of projecting electrically conductive strips 105, the seventeenth vertical row of projecting electrically conductive strips 107 and a twentieth vertical row of projecting electrically conductive strips 113 are preferably connected via a fifth electrical conductor 71, e.g., wire, to the first terminal 124. The second vertical row of projecting electrically conductive strips 77, the third vertical row of projecting electrically conductive strips 79, the sixth vertical row of projecting electrically conductive strips 85, the seventh vertical row of projecting electrically conductive strips 87, the tenth vertical row of projecting electrically conductive strips 93, the eleventh vertical row of projecting electrically conductive strips 95, the fourteenth vertical row of projecting electrically conductive strips 101, the fifteenth vertical row of projecting electrically conductive strips 103, the eighteenth vertical row of projecting electrically conductive strips 109, and the nineteenth vertical row of projecting electrically conductive strips 111 are preferably connected via a sixth

electrical conductor 73, e.g., wire, to the second terminal 126.

[0059] The vest 16 also includes connecting straps to secure the vest 16 to the contestant 12, which includes a first shoulder strap 115, a second shoulder strap 117, a first side strap 119 and a second side strap 121. These straps 115, 117, 119 and 121 can be made a variety of material and attachment mechanisms and preferably includes the use of VELCRO®. VELCRO® is a federally registered trademark of Velcro Industries B.V., which is a limited liability company located in the Netherlands, having a place of business at Castorweg 22-24, Curacao, Netherlands Antilles.

[0060] As previously indicated, the first electrical conductor 63, the third electrical conductor 67 and the fifth electrical conductor 71, e.g., wires, are connected to a first terminal 124 and the second electrical conductor 65, e.g., wire, the fourth electrical conductor 69 and the fifth electrical conductor 73, e.g., wires, are connected to a second terminal 126.

[0061] The first terminal 124 and the second terminal 126 are both located within the electrical control box 38. There is an electrical connection between the first terminal 124 and the second terminal 126 when either the left glove

28, the right glove 30, the left boot 32 or the right boot 34 completes the electrical circuit between two adjacent electrically conductive strips 41, 43, 45 and 47 in the head gear 14 or when either the left glove 28, the right glove 30, the left boot 32 or the right boot 34 completes the electrical circuit between two adjacent electrically conductive strips 49, 51, 53, 55, 57, 59, 61 and 62 in the facemask 36 or when either the left glove 28, the right glove 30, the left boot 32 or the right boot 34 completes the electrical circuit in the pairs 74, 78, 82, 86, 90, 94, 98, 102, 106 and 110 of alternatively projecting electrically conductive strips 75 and 77, 79 and 81, 83 and 85, 87 and 89, 91 and 93, 95 and 97, 99 and 101, 103 and 105, 107 and 109, 111 and 113, respectively.

[0062] The second terminal 126 is electrically connected to the negative terminal 7 of the power supply 6, e.g., battery, via a seventh electrical conductor 130, e.g., wire. There is an electrical indicator 136 that provides either an audio or light indication when the electrical circuit is completed between the first terminal 124 and the second terminal 126. The electrical indicator 136 can be any type of electrically activated sound or light alarm and is preferably a buzzer. The electrical indicator 136 is electrically con-

nected to the positive terminal 8 of the power supply 6, e.g., battery, via an eighth electrical conductor 132, e.g., wire. The first terminal 124 is electrically connected to the electrical indicator 136 via a ninth electrical conductor 134, e.g., wire.

[0063] FIG. 4 is a first alternative embodiment 129 that is identical to that shown in FIG. 3, with the exception that there is a first transmitter 140 that is in parallel with the electrical indicator 136 that transmits a signal when the contestant 12 is hit.

[0064] A second alternative embodiment, includes the concept of electrically separating all relative target areas on the contestant 12, so that it can be determined exactly which portions of the human body have been hit. In addition to providing an indication when the previously described facemask 36 is hit, the headgear 14 is electrically separated into independent regions of contact.

[0065] The first portion of the headgear 14 is the back of the head of the contestant 12, which is generally indicated by numeral 210. The back of the head 210 can also include a series of electrically conductive strips that can vary tremendously in number, configuration, size and shape. In the illustrative, but nonlimiting example shown in FIG. 5,

there is a first electrically conductive strip 212, a second electrically conductive strip 214, a third electrically conductive strip 216, a fourth electrically conductive strip 218, a fifth electrically conductive strip 220 and a sixth electrically conductive strip 222. The electrically conductive strips 212, 214, 216, 218, 220 and 222 should be adjacent to each other and located close enough to each other that when in contact with either a left glove 28, a right glove 30, a left boot 32 or a right boot 34 completes the electrical circuit between a first electrical conductor 224, e.g., wire, and a second electrical conductor 226, e.g., wire. The first electrical conductor 224, e.g., wire, is connected to the first electrically conductive strip 212, the third electrically conductive strip 216 and the fifth electrically conductive strip 220. The second electrical conductor 226, e.g., wire, is connected to the second electrically conductive strip 214, the fourth electrically conductive strip 218 and the sixth electrically conductive strip 222.

[0066] The second portion of the headgear 14 is the right side of the head of the contestant 12, which is generally indicated by numeral 227. The right side of the head 227 can also include a series of electrically conductive strips that can vary tremendously in number, configuration, size and

shape. In the illustrative, but nonlimiting example shown in FIG. 6, there is a seventh electrically conductive strip 228, an eighth electrically conductive strip 230, a ninth electrically conductive strip 232, a tenth electrically conductive strip 234, an eleventh electrically conductive strip 236 and a twelfth electrically conductive strip 238. The electrically conductive strips 228, 230, 232, 234, 236 and 238 should be adjacent to each other and located close enough to each other that when in contact with either a left glove 28, a right glove 30, a left boot 32 or a right boot 34 completes the electrical circuit between a third electrical conductor 240, e.g., wire, and a fourth electrical conductor 242, e.g., wire. The third electrical conductor 240, e.g., wire, is connected to the seventh electrically conductive strip 228, the ninth electrically conductive strip 232 and the eleventh electrically conductive strip 236. The fourth electrical conductor 242, e.g., wire, is connected to the eighth electrically conductive strip 230, the tenth electrically conductive strip 234 and the twelfth electrically conductive strip 238.

[0067] The third portion of the headgear 14 is the left side of the head of the contestant 12, which is generally indicated by numeral 243. The left side of the head 243 can also in-

clude a series of electrically conductive strips that can vary tremendously in number, configuration, size and shape. In the illustrative, but nonlimiting example shown in FIG. 7, there is a thirteenth electrically conductive strip 244, a fourteenth electrically conductive strip 246, a fifteenth electrically conductive strip 248, a sixteenth electrically conductive strip 250, a seventeenth electrically conductive strip 252 and an eighteenth electrically conductive strip 254. The electrically conductive strips 244, 246, 248, 250, 252 and 254 should be adjacent to each other and located close enough to each other that when in contact with either a left glove 28, a right glove 30, a left boot 32 or a right boot 34 completes the electrical circuit between a fifth electrical conductor 256, e.g., wire, and a sixth electrical conductor 258, e.g., wire. The fifth electrical conductor 256, e.g., wire, is connected to the thirteenth electrically conductive strip 244, the fifteenth electrically conductive strip 248 and the seventeenth electrically conductive strip 252. The sixth electrical conductor 258 e.g., wire, is connected to the fourteenth electrically conductive strip 246, the sixteenth electrically conductive strip 250 and the eighteenth electrically conductive strip 254.



[0068] The fourth portion of the headgear 14 is the top of the head of the contestant 12, which is generally indicated by numeral 260. The top of the head 260 can also include a series of electrically conductive strips that can vary tremendously in number, configuration, size and shape. In the illustrative, but nonlimiting example shown in FIG. 8, there is a nineteenth electrically conductive strip 262, a twentieth electrically conductive strip 264, a twenty-first electrically conductive strip 266, a twenty-second electrically conductive strip 268, a twenty-third electrically conductive strip 270 and a twenty-fourth electrically conductive strip 272. The electrically conductive strips 262, 264, 266, 268, 270 and 272 should be adjacent to each other and located close enough to each other that when in contact with either a left glove 28, a right glove 30, a left boot 32 or a right boot 34 completes the electrical circuit between a seventh electrical conductor 274, e.g., wire, and an eighth electrical conductor 276. The seventh electrical conductor 274, e.g., wire, is connected to the nineteenth electrically conductive strip 262, the twenty-first electrically conductive strip 266 and the twenty-third electrically conductive strip 270. The eighth electrical conductor 276, e.g., wire, is connected to the twentieth electrically con-

ductive strip 264, the twenty-second electrically conductive strip 268 and the twenty-fourth electrically conductive strip 272. This is just an illustrative, but nonlimiting, example of the numerous ways of creating conducting regions that can be electrically isolated on the headgear 14 for determining when and where contact or a "hit" occurs.

[0069] As also shown in FIG. 9, this second alternative embodiment also electrically separates a vest 316 into independent regions of contact. Vest 316, shown in FIGS. 3 and 4, is identical to vest 316 in FIG. 9, with the exception of the electrical independence of the various regions of contact. These regions of contact or portions on the contestant 12 can vary tremendously with illustrative, but nonlimiting examples including the torso 302, the groin 304, the abdomen 306, the right lateral trunk 308 and the left lateral trunk 310. A first pair of electrical conductors, e.g., wires, connected to the torso 302 is designated by numerals 320 and 321, respectively. A second pair of electrical conductors, e.g., wires, connected to the groin 304 is designated by numerals 324 and 325, respectively. A third pair of electrical conductors, e.g., wires, connected to the abdomen 306 is designated by numerals 328 and 329, respectively. A fourth pair of electrical conductors, e.g.,

wires, connected to the right lateral trunk 308 is designated by numerals 331 and 332, respectively. Finally, a fifth pair of electrical conductors, e.g., wires, connected to the left lateral trunk 310 is designated by numerals 335 and 336, respectively. This is just an illustrative, but non-limiting, example of the numerous ways of creating conducting regions that can be electrically isolated on the vest 316 for determining when and where contact or a "hit" occurs.

[0070] Moreover, the left glove 28 and right glove 30, as shown in FIG. 1, can be wired independently so that there are separate conductive portions for parts of the hand. As an example illustrating the right glove 30, this can include the back of the hand when made into a fist 402, as shown on FIG. 10, the front portion of the hand when made into a fist 404, as shown on FIG. 11, the radial side of the hand 406, which is otherwise known as the thumb side of the hand as shown in FIG. 12, and the ulnar side of the hand 408, which is otherwise known as the little finger side of the hand as shown in FIG. 13. These are just illustrative, but nonlimiting, examples of some of the numerous ways of creating conductive regions that can be electrically isolated on the gloves 28 and 30 for determining when and

how contact or a "hit" occurs.

[0071] In addition, the left boot 32 and right boot 34, as shown in FIG. 1, can be wired so that there are separate conductive portions for parts of the feet. As an example illustrating the right boot 34, this can include the instep or top of the foot 410, as shown on FIG. 14, the back portion of the heel 412, which is otherwise known as the posterior heel as shown on FIG. 15, the ball of the foot 414, as shown in FIG. 16, and the bottom of the heel 416, which is otherwise known as the bottom of the heel as shown in FIG. 17. These are just illustrative, but nonlimiting, examples of some of the numerous ways of creating conductive regions that can be electrically separated or isolated on the boots 32 and 34 for determining when and how contact or a "hit" occurs.

[0072] An important concept is to try to prevent a contestant from hitting his or her own target with his or her own weapon. One illustrative, but nonlimiting mechanism for doing this could include changing the amount of resistivity of the targets 14, 16, and 36 weapons 28, 30, 32 and 34 for each contestant so that a differential resistivity could be measured and observed so that the striking of a contestant's own targets with the contestant's weapons

would not register. An alternative mechanism would include determining the time of the target being hit and the time of the weapon delivering the hit. If the hits are simultaneous and from the same person, then no score would register.

[0073] There are numerous types of electronic displays that can be utilized with the present invention. A first illustrative, but nonlimiting example, includes a hand-held scoring device that is generally indicated by numeral 420 in FIG. 18, which is preferably, but not necessarily utilized by a referee or judge. There is an electronic display, that is generally indicated by numeral 422 that is preferably a liquid crystal diode (LCD) display, however, any type of electronic output will suffice including a plasma display and a cathode ray tube display among numerous other possibilities.

[0074] A label for the time remaining in the competition is indicated by numeral 424 and the digital output for the score is indicated by numeral 426. For the first contestant, there is a first target label 428 with a first icon of the specific target 430. There is also a first weapon label 446 with a first weapon icon of the specific weapon utilized 448. In addition, there is a first time label 436 with a first digital

output displaying the time 438. There is a first digital output that reflects the score 440 for the first contestant.

[0075] For the second contestant, there is a second target label 442 with a second icon of the specific target 444. There is also a second weapon label 432 with a second weapon icon of the specific weapon utilized 434. In addition, there is a second time label 450 with a digital output displaying the time 452. There is a second digital output that reflects the score 454 for the second contestant. In addition or in the alternative, the contestants can be shown as different colors, e.g., red for the first contestant including associated weapons, targets and score and blue for the second contestant including associated weapons, targets and score.

[0076] There are a numerous operational input devices that can be utilized with the hand-held scoring device 420, which are preferably pushbutton switches due to cost, however touch screen input could also be utilized. Illustrative, but nonlimiting examples, generally indicated by numeral 455. The first is an on/off input device, e.g., push button, which is indicated by numeral 456. The second switch is a points awarded input device 462, e.g., push button, for the referee or judge to be able to award points to a par-

ticular contestant. The third input device, e.g., pushbutton, is indicated by numeral 468 that is utilized to stop and start the timer. The fourth input device is preferably, but not necessarily, a rotary switch 458 that allows the user to select any a variety of types of display appearing in the electronic display 422. In this illustrative, but non-limiting example, that includes a first display 474, which could be a complete display; a second display 475, which could a first type of abbreviated display; a third display 476 which could a second type of abbreviated display; and a fourth display 477, which could be a target-only type of display. A fifth input device 464, e.g., pushbutton, allows the user, e.g., judge, to be able to give a warning to one of the contestants. A sixth input device 470, e.g., pushbutton, allows the user, e.g., referee or judge, to be able to correct an error. A seventh input device 460, e.g., pushbutton, allows the user, e.g., referee or judge, to be able to reset the entire hand-held scoring device 420. Finally, an eighth input device 472, e.g., pushbutton, allows the user, e.g., judge, to be able to page through memory to look at previous scores for a prior portion of the contest or other previous contests.

[0077] Referring now to FIG. 19, the illustrative, but nonlimiting

example of the complete display is generally indicated by numeral 474. The previously referenced first target label 428 for the first contestant, second weapon label 432 for the second contestant and the second time label 436 for the second contestant is again shown. In an illustrative, but nonlimiting example, a one (1) two (2) combination of a left back fist followed by a right reverse punch committed by the second contestant (0.2 seconds later) on the first contestant is displayed on the on the electronic display 422 for the hand-held scoring device 420. The first target icon 430 first displays the face of the first contestant 480 and then displays the torso of the first contestant 482. The second weapon icon 434 first displays the back portion of the fist 484 and an alphabetic display that it is the left fist 485 for the second contestant. The second weapon icon 434 then displays the front portion of the fist 486 and an alphabetic display that identifies it is the right fist 487 of the second contestant. The second time output 438 first displays the elapsed time in seconds 488 when the face of the first contestant 480 is being struck by the back portion of the left 485 fist 484 of the second contestant, e.g., 0.0 seconds, and then displays the elapsed time in seconds 490 when the torso of the



first contestant 482 is being struck by the front portion of the right 487 fist 486 of the second contestant, e.g., 0.2 seconds.

[0078] Referring now to FIG. 20, the illustrative, but nonlimiting, second example of the complete display is again generally indicated by numeral 474. The previously referenced first target label 428, first weapon label 432 and first time label 436 for the first contestant and the second target label 442, second weapon label 446 and second time label 450 for the second contestant is again shown. In this illustrative, but nonlimiting example, there is a wheel kick by the second contestant with his or her left foot to the right side portion of the head of the first contestant that simultaneously occurs with a snap kick by the first contestant with his or her left foot to the groin of the second contestant. This is followed by a left fist of the first contestant hitting the second contestant in left side of the head (one-half a second later), which is all displayed on the electronic display 422 for the hand-held scoring device 420. The first target icon 430 first displays the right side portion of the head 502 of the first contestant. The second weapon icon 434 displays the bottom portion of the left foot for the second contestant 504 and provides

an alphabetic output indication 506 that it is the left foot. The second time output 438 first displays the elapsed time in seconds 508, e.g., 0.0 seconds, when the right side portion of the head of the first contestant is being struck by the bottom portion of the left foot by the second contestant.

[0079] The second target icon 444 first displays a groin 510 and is then followed by the left side portion of the head 512, illustrating the targeted portions of the second contestant that that has been struck by the first contestant and the sequence. The first weapon icon 448 first displays a bottom portion of a left foot 514 with an alphabetic output indication that it is the left foot 518 and is then followed by the front portion of the left fist 516 with an alphabetic output indication that it is the left fist 520 for the first contestant. The first time output 452 first displays the elapsed time in seconds 522 when the groin 510 of the second contestant is being struck by the bottom portion of the left 518 foot 514 of the first contestant. The first time output 452 then displays the elapsed time in seconds 524, e.g., 0.0 seconds, when the left side of the head of the second contestant 512 is being struck by the front portion of the left 520 fist 516 of the first contestant, e.g.,

0.5 seconds.

[0080] Referring now to FIG. 21, the illustrative, but nonlimiting example of the first abbreviated display is generally indicated by numeral 475. The previously referenced first target label 428 for the first contestant and the second weapon label 446 and second time label 450 for the second contestant is again shown. In this illustrative, but nonlimiting example, there is a one (1) two (2) combination with the second contestant striking the front portion of the face of the first contestant with the left hand followed by the second contestant striking the torso of the first contestant with the right hand (0.2 seconds later), which is displayed on the electronic display 422 for the hand-held scoring device 420. The first target icon 430 first displays the face of the first contestant 480 and then displays the torso of the first contestant 482. The second weapon icon 448 first displays the left hand 526 of the second contestant with an alphabetic display that identifies it is the left hand 485 of the second contestant. The second weapon icon 448 then displays the right hand 528 of the second contestant with an alphabetic display that identifies it is the right hand 487 of the second contestant. The second time output 452 first displays the

elapsed time in seconds 488 when the face of the first contestant is being struck by the left 485 hand 526 of the second contestant, e.g., 0.0 seconds, and then displays the elapsed time in seconds 490 when the torso of the first contestant is being struck by the right 487 hand 528 of the second contestant, e.g., 0.2 seconds.

[0081] Referring now to FIG. 22, the illustrative, but nonlimiting first example of the second abbreviated display is generally indicated by numeral 476. The previously referenced first target label 428 for the first contestant and the second weapon label 446 and second time label 450 for the second contestant is again shown. In this illustrative, but nonlimiting example, there is a one (1) two (2) combination with the second contestant striking the front portion of the face of the first contestant with the left hand followed by the second contestant striking the torso of the first contestant with the right foot (0.2 seconds later), which is displayed on the electronic display 422 for the hand-held output device 420. The first target icon 430 first displays the face of the first contestant 480 and then displays the torso of the first contestant 482. The second weapon icon 448 first displays an alphabetic output display that identifies the weapon as the hand 534 of the

second contestant and an alphabetic output display that identifies the hand 534 as the left hand 530. The second weapon icon 448 then displays an alphabetic output display that identifies the weapon as the foot 536 of the second contestant and an alphabetic output display that identifies the particular foot 536 as the right foot 532. The second time output 452 first displays the elapsed time in seconds 488 when the face of the first contestant is being struck by the left 530 hand 534 of the second contestant, e.g., 0.0 seconds, and then displays the elapsed time in seconds 490 when the torso of the first contestant is being struck by the right 532 foot 536 of the second contestant, e.g., 0.2 seconds.

[0082] Referring now to FIG. 23, which is an illustrative, but non-limiting, second example of the second abbreviated display that is generally indicated by numeral 476. The previously referenced first target label 428, first weapon label 432, first time label 436 for the first contestant and the second target label 442, second weapon label 446 and second time label 450 for the second contestant is again shown. In this illustrative, but nonlimiting example, the second contestant strikes the first contestant in the front of the face with his or her left hand followed by the first

contestant striking the second contestant in the torso with his or her right hand (0.2 seconds later), which is displayed on the electronic display 422 for the hand-held display 420. The first target icon 430 first displays the face of the first contestant 480. The second weapon icon 448 first displays an output display that identifies the weapon as the hand 534 of the second contestant and in particular, it is the left hand 530. The second time output 452 first displays the time in seconds 488 when the face of the first contestant 480 is being struck by the left 530 hand 534 of the second contestant, e.g., 0.0 seconds.

[0083] Then, 0.2 seconds later, the first contestant strikes the second contestant in the torso with his or her right hand, the second target icon 444 displays a torso 552 of the second contestant. The first weapon icon 434 then displays an output display that identifies the weapon as the hand 534 of the first contestant and in particular, identifies the hand 534 as the right hand 532. The first time output 438 then displays the time in seconds 542 when the torso of the second contestant is being struck by the right 532 hand 532 of the first contestant, e.g., 0.2 seconds.

[0084] Referring now to FIG. 24, which is an illustrative, but non-

limiting, third example of the second abbreviated display, which is generally indicated by numeral 476. The previously referenced first target label 428, first weapon label 432 and first time label 436 for the first contestant and the second target label 442, second weapon label 446 and second time label 450 for the second contestant is again shown. In this illustrative, but nonlimiting example, the second contestant strikes the first contestant with his or her left hand in the front portion of the face, which occurs simultaneously with the first contestant striking the torso of the second contestant with his or her right hand, which is displayed on the hand-held display 420. The first target icon 430 first displays the face of the first contestant 480. The second weapon icon 448 first displays an output display that identifies the weapon as the hand 534 of the second contestant and in particular, it is the left hand 530. The second time output 452 first displays the time in seconds 488, e.g., 0.0 seconds, when the face of the first contestant is being struck by the left 530 hand 534 of the second contestant. The second target icon 444 then displays an output display that identifies the target as the torso 552 of the second contestant. The first weapon icon 434 displays an output display that identifies the weapon

as the hand 534 of the second contestant and in particular, it is the right hand 532. The first time output 438 displays the time in seconds 542 when the torso of the second contestant is being struck by the right 532 hand 534 of the first contestant, e.g., 0.0 seconds.

[0085] Referring now to FIG. 25, which is an illustrative, but non-limiting, fourth example of the second abbreviated display, which is generally indicated by numeral 476. The previously referenced first target label 428, first weapon label 432 and first time label 434 for the first contestant and the second target label 442, second weapon label 446 and second time label 450 for the second contestant is again shown. In this illustrative, but nonlimiting example, the second contestant strikes the first contestant with his or her left hand in the front portion of the face that occurs simultaneously with the first contestant striking the torso of the second contestant with his or her right hand and then the second contestant strikes the back portion of the head of the first contestant (0.3 seconds later), which is displayed on the hand-held display 420. The first target icon 430 first displays the face of the first contestant 480. The second weapon icon 448 first displays an output display that identifies the weapon as the hand 534 of the



second contestant and in particular, it is the left hand 530. The second time output 452 first displays the time in seconds 488 when the face of the first contestant is being struck by the left 530 hand 534 of the second contestant, e.g., 0.0 seconds. The second target icon 444 then displays an output display that identifies the target as the torso 552 of the second contestant. The first weapon icon 434 displays an output display that identifies the weapon as the hand 534 of the second contestant and in particular, it is the right hand 532. The first time output 438 displays the time in seconds 541 when the torso of the second contestant is being struck by the right 532 hand 534 of the first contestant, e.g., 0.0 seconds. Then, 0.3 seconds later, this is followed by the first target icon 430 displaying the back portion of the head 560 of the first contestant. The second weapon icon 448 then displays an output display that identifies the weapon as the hand 534 of the second contestant and in particular, it is the right hand 532. The second time output 452 then displays the time in seconds 542 when the back portion of the head of the first contestant is being struck by the right 532 hand 534 of the second contestant, which can be compared to the previous strike to the face of the first contestant to

ascertain the time between strikes on the first contestant, e.g., 0.3 seconds.

[0086] Referring now to FIG. 26, the illustrative, but nonlimiting example of an abbreviated display is generally indicated by numeral 477 that is a target-only display. In an illustrative, but nonlimiting example, a one (1) two (2) combination of a left back fist followed by a right reverse punch committed by the second contestant on the first contestant is displayed on the hand-held display 420. There is a target label 428 and a time label 450. The first target icon 430 first displays the face of the first contestant 480 and then displays the torso of the first contestant 482. The time output 452 first displays the time in seconds when the face of the first contestant is being struck by the second contestant 488, e.g., 0.0 seconds and then displays the time in seconds when the torso of the first contestant is being struck by the second contestant 490, e.g., 0.2 seconds.

[0087] Referring now to FIG. 27, there are first electrical conductors 602, e.g., wires, fiber optic cables, conductive material and so forth, coming from the various targets for each contestant. In addition, a signal can be generated each time one of the regions on a weapon has electrical current

passing through it. As previously shown, the number of targets and/or weapons can vary tremendously as well as the regions located on the number of regions on each weapon and/or target. These electrical conductors 602, e.g., wires, are connected to a first transmitter 140 that generates a signal, e.g., radio, that is sent via a first antenna 606 each time a target or a region on a target is stuck. It is also possible to generate radio signals that are sent via the first antenna 606 each time current is passing through a weapon or a region on a weapon.

[0088] Referring now to FIG. 28, the transmitted signal, e.g., radio, can be picked-up by a first receiver 608, .e.g., radio signal, via a second antenna 607. The converted signal is then provided to a processor 610, which preferably includes signal processing and timing functions, which is component of the hand-held scoring device 420 used by the referee or official. The referee can alter the score for each contestant with the award of points, the addition or subtraction of points, stopping the timer and so forth as previously described and then shown on the previously described electronic display 422. This output can also be sent to a second transmitter 612 that generates signals, e.g., radio, that replicates the information or a portion of

the information that is shown output of the electronic display 422. The second transmitter 610 is connected to a third antenna 614. There is a power supply attached to each one of these electrical components that is not shown.

[0089] Referring now to FIG. 29, the signals, e.g., radio, from the second transmitter 612 are picked-up by a second receiver 617 via a fourth antenna 616. There are second electrical conductors 618, e.g., wires, fiber optic cables, conductive material and so forth, connecting the second receiver 617 with a second electronic display 620, e.g., scoreboard. The second electronic display 620 can be of virtually any type ranging from a public scoreboard to a handheld display for the referee. The second electronic display 620 is preferably an incandescent light array, however a liquid crystal diode display (SGVA), cathode ray tube, plasma screen, light-emitting diode and other types of electronic displays will suffice.

[0090] Any of a wide variety of antennas, transmitters, receivers and electrical scoreboard displays will suffice for this present application. An example of a scoreboard display utilizing a transmitter and receiver includes U.S. Patent No. 5,612,711, which issued on March 18, 1997 and is

assigned to Tally Display Corporation, is incorporated herein by reference. Another example includes U.S. Patent No. 6,030,109, which issued on February 29, 2000 to Lobsenz, which is also incorporated herein by reference. An example of a receiver and transmitter used to transmit and receive sports information is disclosed in U.S. Patent No. 6,473,483, which issued to Pyles on October 29, 2002, and is also incorporated herein by reference.

[0091] Although a preferred embodiment of the method and apparatus for recording hits while sparing has been illustrated in the accompanying Drawings and described in the foregoing Detailed Description, it is understood that the invention is not limited to the embodiment disclosed, but is capable of numerous rearrangements, modifications and substitutions without departing from the spirit for the invention as set forth and defined by the following claims.